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ABSTRACT

In spring 1996, Lexington Community College (LCC) in Kentucky, conducted a survey to gather information on employment trends and educational needs in the field of network systems administration (NSA). NSA duties involve the installation and administration of network operating systems, applications software, and networking infrastructure; assessment of computing and networking needs; and development of small utility programs for managing the computing environment. Surveys were mailed to 1,500 area businesses, with 11% (n=160) returning completed questionnaires. Study findings included the following: (1) 42% described their business as manufacturing-related, 9% as health care-related, and 8% as public accounting-related; (2) 45% indicated that they used Novell Netware for their network, while 19% (n=29) had no network in place; (3) of the 29 respondents without a network, 55% said that they hoped to install one in the next 5 years; (4) of 159 respondents, 69% indicated that they currently employed a network systems administrator and 31% said they did not; (5) overall, respondents identified a need for 46 NSAs immediately, 114 within 1 to 5 years, and 105 within 6 to 10 years; and (6) skills for successful employment rated as "very important" most often were problem-solving skills, network management and troubleshooting, and analytical skills. Employer comments to selected questions and the survey instrument are appended. (HAA)

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NETWORK SYSTEMS ADMINISTRATION NEEDS ASSESSMENT

July, 1996

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Network Systems Administration
Advisory Committee*

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Introduction

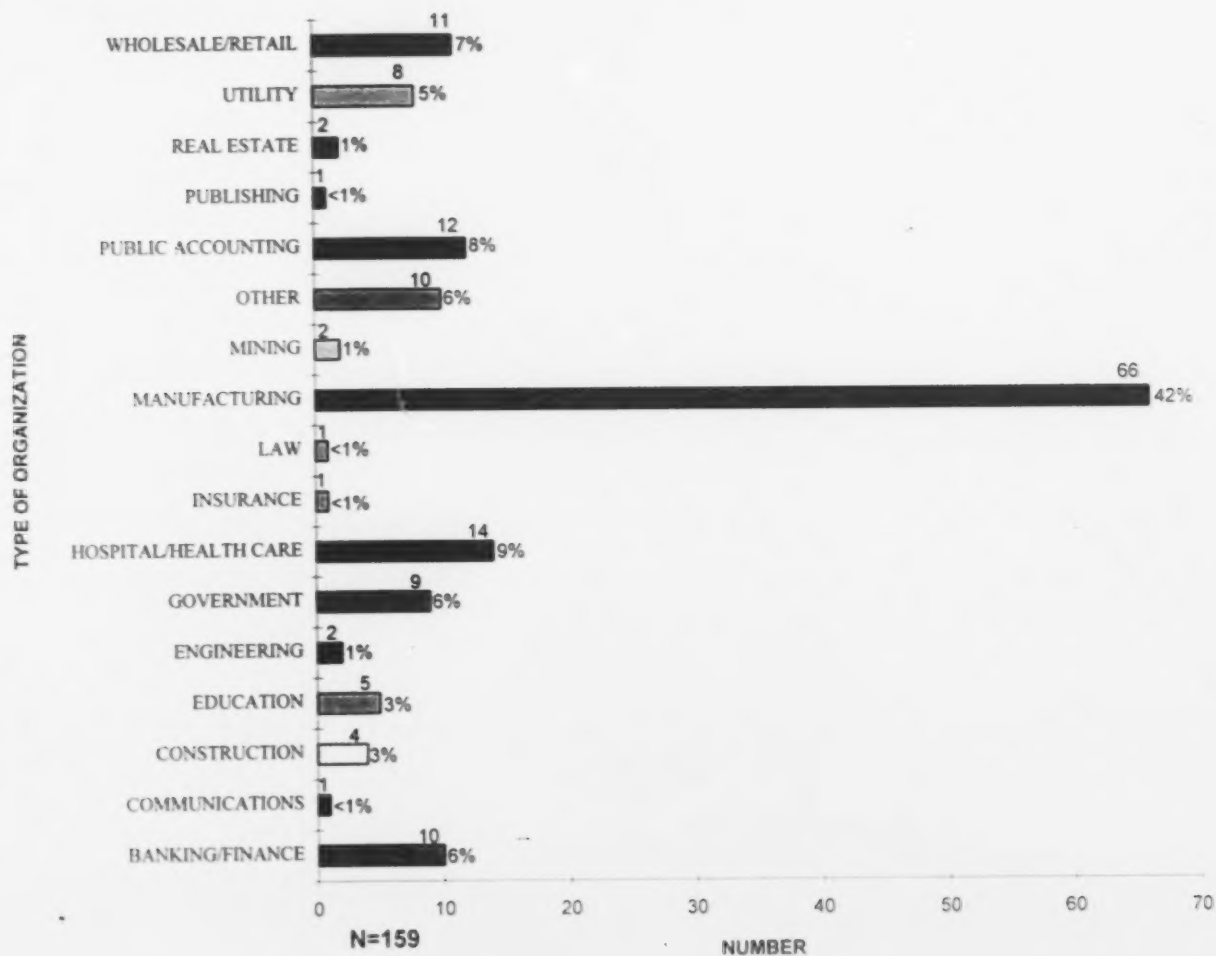
The Network Systems Administrator Survey was distributed and collected in March, April and May, 1996. Fifteen hundred surveys were mailed, with a return rate of 11% (N=160). The purpose of the survey was to assist the Lexington Community College (LCC) in gathering information about employment trends and educational needs in the Network Systems Administration field.

Network Systems Administrators were defined as user-oriented individuals who are given a variety of titles, but their duties and responsibilities involve some or all of the following: installation and administration of network operating systems; installation of applications software; installation or supervision of the installation of networking infrastructure; assessment of computing and networking needs of an organization; and development of small utility programs and procedures for managing the computing environment.

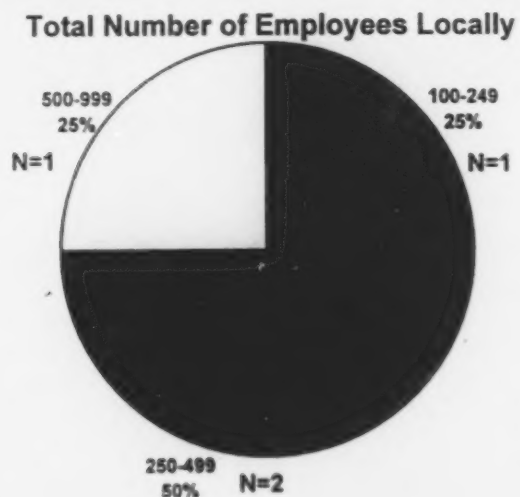
A complete copy of the survey can be found in Appendix A of this report.

Results

Question 1. Which of the following would best describe your organization? 159 survey respondents answered this question.

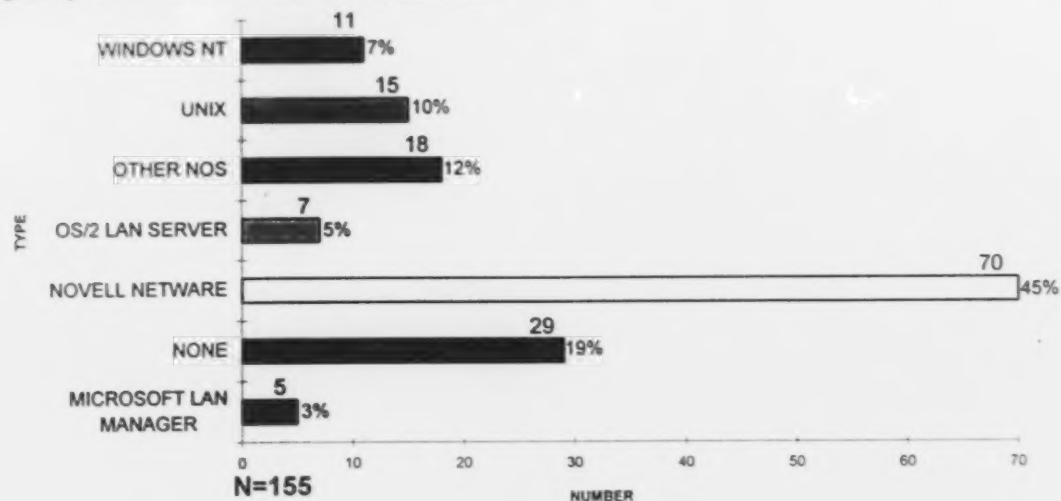


Question 2. What is the total number of employees in your organization?



Question 3. What type of networked computer system do you currently use?

155 survey respondents answered this question.



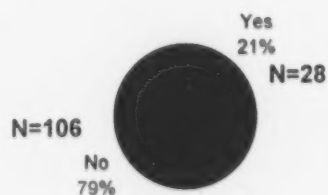
Question 4. If you answered none to Question 3, do you expect or hope to install a networked computer system within the next five years? 44 survey respondents answered this question.



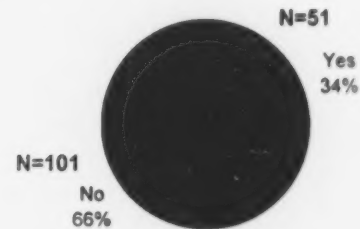
Question 5a. Do you currently employ a full or part-time network systems administrator or an individual with any of the responsibilities described above? 159 survey respondents answered this question.



Question 5b. Do you have plans to hire a(n) individual(s) full or part-time whose responsibilities will include network systems administration? 134 survey respondents answered this question.



Question 5c. Do you outsource any of your network systems administrator responsibilities?
152 survey respondents answered this question.



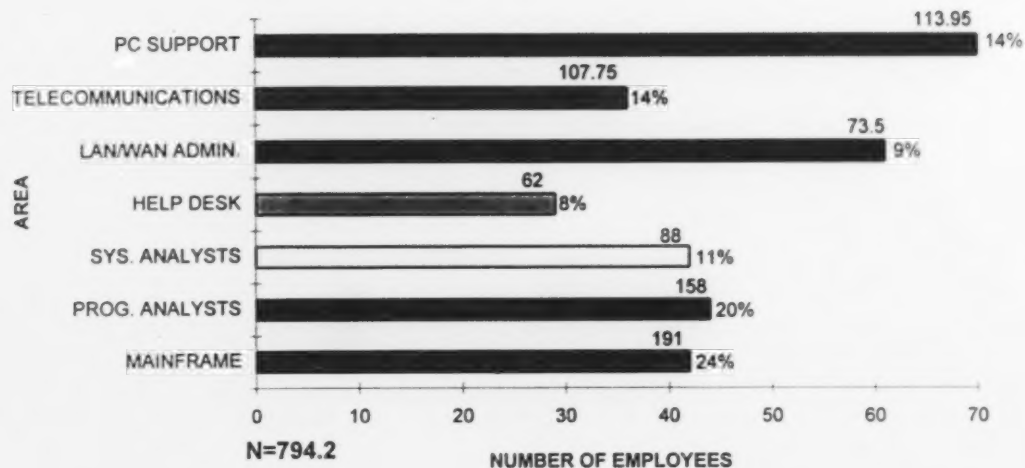
Question 6. How many personal computer/workstations do you have?
135 survey respondents answered this question.

Total Personal Computer/Workstations = 18,190
Range = 2 - 5,000
Average = 135

Question 7. How many users do you have?
132 survey respondents answered this question.

Total Users = 39,559
Range = 2 - 14,000
Average = 300

Question 8. How many people are employed in each of the following areas?
324 survey respondents answered this question.



Question 9. How many employees in your Information Systems department could benefit from a network systems administrator program? 95 survey respondents answered this question.

Total to Benefit = 808
 Range = 1 - 500
 Average = 9

Question 10. How many employees in other departments could benefit from coursework in a network systems administrator program? 59 survey respondents answered this question.

Total to Benefit in Other Departments from Coursework = 864
 Range = 0 - 500
 Average = 15

Question 11. How many of your current employees could benefit from training in hardware/software troubleshooting/repair? 106 survey respondents answered this question.

Total to Benefit from Hardware/Software Training = 1,675

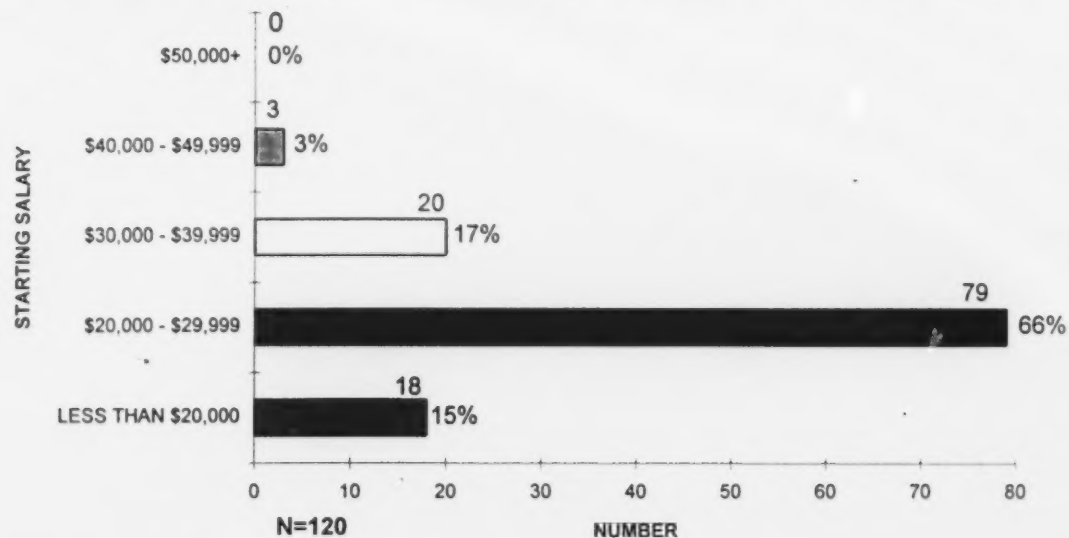
Range = 1 - 600

Average = 16

Question 12. What are your immediate and future employment needs for network systems administrators? 148 survey respondents answered this question.

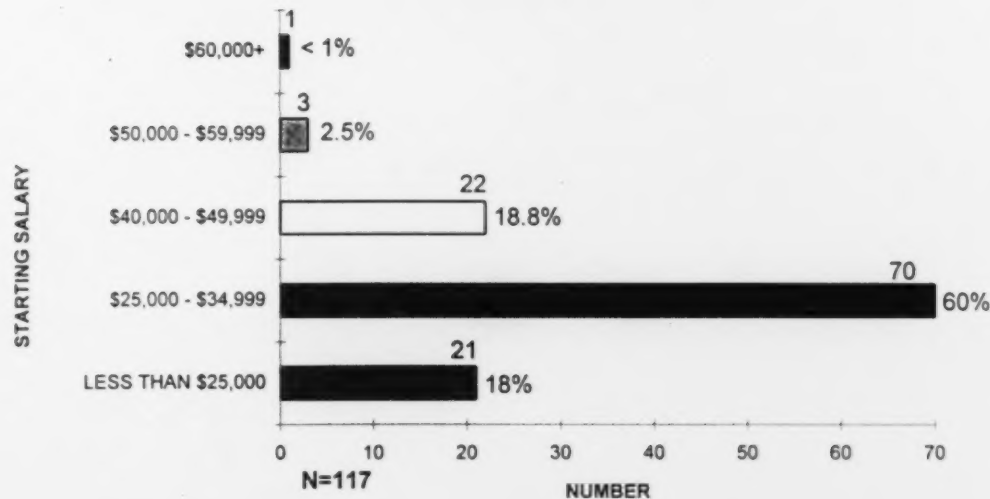
	Immediate	Short 1-5 Yrs.	Long 6-10 Yrs.	Cumulative Total
Total	46	114	105	265
Range	1 - 6	1 - 11	1 - 11	
Average	1	2	2	

Question 13. What starting salary would you expect to offer a new graduate of an Associate Degree Program in Network Systems Administration. 120 survey respondents answered this question.



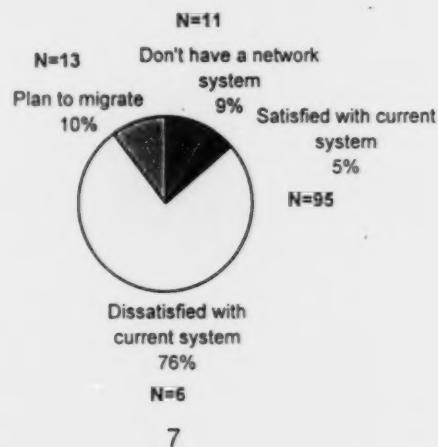
Question 14. What starting salary would you expect to offer a graduate of an Associate Degree Program in Network Systems Administration with an additional two to four years experience?

117 survey respondents answered this question.

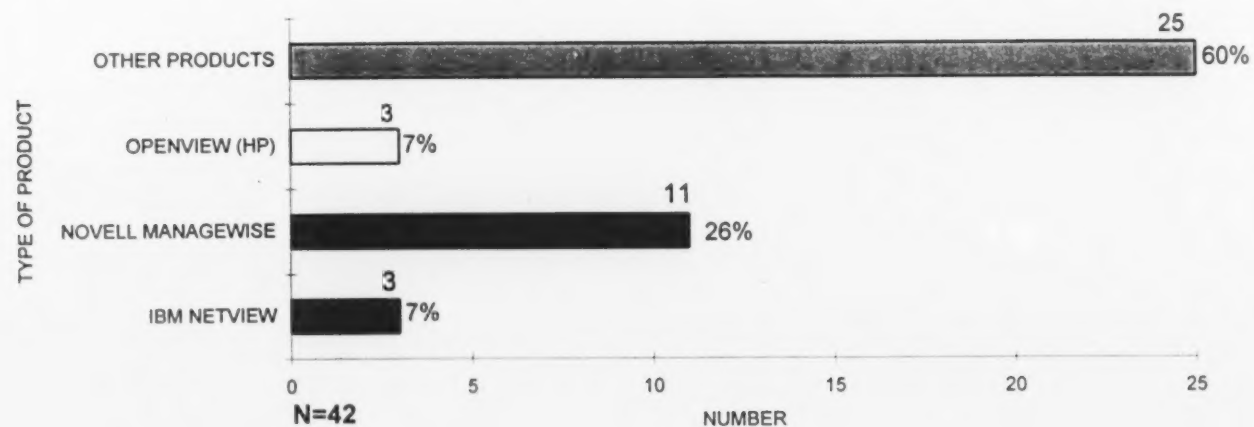


Salary Range	Number	% of Total
LESS THAN \$25,000	21	17.95
\$25,000 - \$34,999	70	59.83
\$40,000 - \$49,999	22	18.80
\$50,000 - \$59,999	3	2.56
\$60,000+	1	0.85
TOTAL	117	100.00

Question 15. If you currently use a network, are you satisfied with its performance or are you considering migration to a different network operating system? 124 survey respondents answered this question.



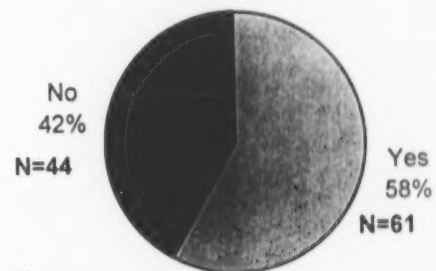
Question 16. If you are using any type of pro-active network management products, please identify them below.
42 survey respondents answered this question.



Question 17. Please rate the importance of the following skills for successful employment as a network systems administrator. Use the following descriptors to rate each item.

Skills	Total Not Applicable	% of Total	Total Not Important	% of Total	Total Somewhat Important	% of Total	Total Important	% of Total	Total Very Important	% of Total	Total
Analytical Skills	0	0	0	0	6	1	36	4	75	7	130
Business Skills	0	0	6	6	44	11	49	5	21	2	144
Desktop Publishing Skills	4	27	33	31	44	11	31	3	7	1	192
Employee Ethics	0	0	0	0	13	3	38	4	69	7	134
Familiarity with Cabling	0	0	4	4	20	5	48	5	46	4	136
Knowledge of Digital Electronics	1	7	15	14	36	9	39	4	27	3	154
Knowledge of Groupware Prod.	1	7	5	5	32	8	49	5	29	3	143
LAN/WAN Integration	4	27	6	6	10	2	49	5	47	5	161
Lan-to-Host Integration	3	20	5	5	16	4	44	5	46	4	152
Mathematical Skills	0	0	10	10	40	10	52	6	18	2	146
Network Design	0	0	2	2	11	3	57	6	49	5	134
Network Installation	0	0	2	2	14	3	37	4	66	6	135
Network Management	0	0	0	0	7	2	28	3	86	8	134
Network Troubleshooting/Rep.	0	0	0	0	4	1	35	4	81	8	133
Oral Communication	0	0	3	3	12	3	65	7	39	4	136
"People Skills"	0	0	0	0	18	4	51	5	49	5	133
Problem Solving Skills	0	0	0	0	3	1	28	3	89	9	132
Programming Skills	0	0	12	11	35	8	38	4	33	3	145
Teamwork Skills	0	0	2	2	13	3	44	5	59	6	133
Technical Expertise	0	0	0	0	4	1	44	5	67	7	127
Written Communication	1	7	0	0	30	7	64	7	24	2	142
Other	1	7	0	0	4	1	7	1	0	0	20
Total	15	100	105	100	416	100	933	100	1027	100	2996

Question 18. May we contact you regarding your company's training needs and responses to this survey?
105 survey respondents answered this question.



COMMENTS

Question 1. Which of the following would best describe your organization?

- * Retail Gift and Coin Store
- * Nursing Home
- * Entertainment
- * Automobile Sales, Leasing Service, and Parts
- * Community Mental Health, Mental Retardation, Substance Abuse Center
- * Social Service
- * Library
- * Hospitality - Hotel/Restaurants
- * RV Retail Dealership

Question 3. What type of networked computer system do you currently use?

- * AS/400
- * WAN
- * IBM System 36
- * Kentucky Statewide Network Mainframe
- * VAX/VMS Pathworks
- * In-House Program
- * PC/TCP
- * Alpha Micro
- * Connected to corporate AS/400
- * Lantastic
- * Ungermann-Bass Broadband
- * Novell-Lan-Workplace
- * OS/400 Advanced 36
- * Pathworks
- * WFWG
- * VAX System

Question 15. If you currently use a network, are you satisfied with its performance or are you considering migration to a different network operating system?

- * Novell or Windows NT
- * Expand existing system
- * NT

Question 16. If you are using any type of pro-active network management products, please identify them below.

- * SNMP Software
- * Implement the HBOC
- * IBM Lan Manager
- * McAfee
- * Triad
- * Intel LANdesk Manager
- * Lanwatch, Net Director
- * Cisco Works
- * Prodigy
- * Hubwatch, Manage Works
- * Cabletron Lanview
- * Pathworks

Questions 17. Please rate the importance of the following skills for successful employment as a network systems administrator.

- * Needs continuing education
- * Patience
- * Office Politics
- * Communications/Hardware
- * Accounting and Bookkeeping

Additional Comments

- * You are free to contact our corporate MIS office 1-800-584-6614. Lion Apparel
- * Some of your questions too open-ended. Questions 9, 10, and 11 may want to prompt with number of departments within organization.
- * Graduate of LCC with degree in Data Processing Technology. Paid dues with low salary and menial task to reach current position. Education is only the beginning of learning.
- * Support Services for network are provided from office in Nashville. Don't foresee need to have someone in local office.
- * Network Administrator Program is a great idea. The time is right.
- * Should be better than the way learned which was the school of hard knocks.
- * Most people seeking education in this field will want to get education from NAEC (Novell Authorized Education Center) or ATEC (MicroSoft) so certification can be received from vendors.
- * Vendors receive a lot of money from these programs and like to maintain control. Generally these programs are not associated with community colleges. People would rather pursue this education away from a college.
- * Salaries paid in school districts to network administrators are sometimes lower than in business.
- * Looking to integrate administrative network and factory floor controls network with one system administrator. Ability to train and transfer working knowledge is a must!

- * Hands on experience is very valuable. Along with degree, also like to see vendor certifications such as from Novell and Microsoft (CNE & CNA).
- * Need short non-degree program for small LAN applications, with a part-time administrator.
- * What size LAN is considered to justify a full-time network administrator.
- * Currently using a lot of network and lan communications hardware to network all facilities to a corporate location. Useful for members to understand the complete picture of how it all works.
- * Networking PC's in business environment is overrated. Mini's in the OS/400 and UNIX environment are more stable and easier to maintain. Tend to be more "crash" proof. Full-time administrator not needed to keep system up and running.
- * Office is small, not planning to employ solely a network administrator. Currently office manager assumes role of computer systems administrator.
- * Corporate plant is in Deerfield, MA. and computer programmer is there. All computer decisions are made at corporate office.

Appendix A

**NETWORK SYSTEMS ADMINISTRATOR
NEEDS ASSESSMENT**

The purpose of this survey is to assist LCC and the other thirteen community colleges within the University of Kentucky Community College System in gathering information about employment and educational needs in the field of network systems administration. Your responses will provide direction for educational program development. The names of firms and businesses replying will not be released. **ALL RESPONSES ARE STRICTLY CONFIDENTIAL.** We appreciate your time in completing this survey.

DEFINITION: *Network Systems Administrators are user-oriented individuals who are given a variety of titles, but their duties and responsibilities involve some or all of the following: installation and administration of network operating systems; installation of applications software; installation or supervision of the installation of networking infrastructure; assessment of computing and networking needs of an organization; and development of small utility programs and procedures for managing the computing environment.*

Please indicate your response by circling the number corresponding to your choice(s).

1. Which of the following would best describe your organization? (Circle one)
- | | | |
|-------------------------|-----------------------|----------------------|
| 1. Banking/Finance | 8. Insurance | 15. Transportation |
| 2. Communications | 9. Law | 16. Utility |
| 3. Construction | 10. Manufacturing | 17. Wholesale/Retail |
| 4. Education | 11. Mining | 18. Other |
| 5. Engineering | 12. Public Accounting | |
| 6. Government | 13. Publishing | |
| 7. Hospital/Health Care | 14. Real Estate | |

2. What is the total number of employees in your organization?

	1-4	5-9	10-19	20-49	50-99	100-249	250-499	500-999	1000+
Local									
Surrounding Areas									

3. What type of networked computer system do you currently use?
- | | |
|--------------------------|-----------------------------------|
| 1. Novell Netware | 5. OS/2 LAN Server |
| 2. MicroSoft LAN Manager | 6. Other Network Operating System |
| 3. Windows NT | 7. _____ |
| 4. UNIX | 7. None |
4. If you answered none to question 3, do you expect or hope to install a networked computer system within the next five years?
- | | |
|--------|-------|
| 1. Yes | 2. No |
|--------|-------|
- 5a. Do you currently employ a full or part-time network systems administrator or an individual with any of the responsibilities described above?
- | | |
|--------|-------|
| 1. Yes | 2. No |
|--------|-------|
- 5b. Do you have plans to hire a(n) individual(s) full or part-time whose responsibilities will include network systems administration?
- | | |
|--------|-------|
| 1. Yes | 2. No |
|--------|-------|
- 5c. Do you outsource any of your network systems administrator responsibilities?
- | | |
|--------|-------|
| 1. Yes | 2. No |
|--------|-------|

IF YOU ANSWERED NONE TO QUESTION 3 AND NO TO QUESTIONS 4 AND 5, YOUR ANSWERS TO THIS SURVEY ARE COMPLETE. PLEASE RETURN THE ENTIRE SURVEY IN THE ENVELOPE PROVIDED. THANK YOU FOR YOUR TIME AND ASSISTANCE! OTHERWISE, PLEASE CONTINUE TO QUESTION 6.

6. How many personal computers/workstations do you have? _____
7. How many users do you have? _____
8. How many people at your organization are employed in each of the following areas?
- | | |
|----------------------------------|-------|
| 1. Mainframe | _____ |
| 2. Programmer Analysts | _____ |
| 3. Systems Analysts | _____ |
| 4. Help Desk | _____ |
| 5. LAN/WAN Network Administrator | _____ |
| 6. Telecommunications | _____ |
| 7. PC Support | _____ |
9. How many employees in your Information Systems could benefit from a network systems administrator program? _____

10. How many employees in other departments could benefit from coursework in a network systems administrator program? _____

11. How many of your current employees could benefit from training in hardware/software troubleshooting/repair? _____

12. What are your immediate and future employment needs for network systems administrators? (Please specify)

	Immediate (Present)	Short-Term (5 Years)	Long-Term (10 Years)
Network Systems Administrator(s)	_____	_____	_____

13. What starting salary would you expect to offer a new graduate of an Associate Degree Program in Network Systems Administration?

- | | |
|-----------------------|----------------------|
| 1. Less than \$20,000 | 4. \$40,000-\$49,999 |
| 2. \$20,000-\$29,999 | 5. \$50,000+ |
| 3. \$30,000-\$39,999 | |

14. What starting salary would you expect to offer a graduate of an Associate Degree Program in Network Systems Administration with an additional two to four years experience?

- | | |
|-----------------------|----------------------|
| 1. Less than \$25,000 | 4. \$50,000-\$59,999 |
| 2. \$25,000-\$34,999 | 5. \$60,000+ |
| 3. \$40,000-\$49,999 | |

15. If you currently use a network, are you satisfied with its performance or are you considering migration to a different network operating system?

- | | |
|----------------------------------|-------------------------------------|
| 1. Don't have a networked system | 3. Dissatisfied with current system |
| 2. Satisfied with current system | 4. Plan to migrate to _____ |

16. If you are using any type of pro-active network management products, please identify them below.

- | | |
|----------------------|-------------------|
| 1. Novell Managewise | 3. IBM NetView |
| 2. OpenView (H.P.) | 4. Other products |
- _____

17. Please rate the importance of the following skills for successful employment as a network systems administrator. Use the following descriptors to rate each item. (Circle one)

Skills	Not Applicable	Not Important	Somewhat Important	Important	Very Important
1. Analytical Skills	0	1	2	3	4
2. Business Skills	0	1	2	3	4
3. Desktop Publishing Skills	0	1	2	3	4
4. Employee Ethics	0	1	2	3	4
5. Familiarity with Cabling	0	1	2	3	4
6. Knowledge of Digital Electronics	0	1	2	3	4
7. Knowledge of Groupware Products	0	1	2	3	4
8. LAN/WAN Integration	0	1	2	3	4
9. LAN-to-Host Integration	0	1	2	3	4
10. Mathematical Skills	0	1	2	3	4
11. Network Design	0	1	2	3	4
12. Network Installation	0	1	2	3	4
13. Network Management	0	1	2	3	4
14. Network Troubleshooting & Repair	0	1	2	3	4
15. Oral Communication	0	1	2	3	4
16. "People Skills"	0	1	2	3	4
17. Problem Solving Skills	0	1	2	3	4
18. Programming Skills	0	1	2	3	4
19. Teamworking Skills	0	1	2	3	4
20. Technical Expertise	0	1	2	3	4
21. Written Communication	0	1	2	3	4
22. Other _____	0	1	2	3	4

Results of this survey will be analyzed in summary form only. If you would like a copy of the survey results, please provide your name and the address of your company in the space below.

May we contact you regarding your company's training needs and responses to this survey?

1. Yes 2. No

Please provide any additional comments you wish in the space provided below.

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THANK YOU FOR YOUR TIME IN COMPLETING THIS SURVEY!